

96. (New) The ultra-disperse semi-metal/metal oxide nano-particle of claim 94, wherein the metal oxide is selected from the group consisting of  $\text{SiO}_2$ ,  $\text{Al}_2\text{O}_3$  and  $\text{TiO}_2$ .
97. (New) The ultra-disperse semi-metal/metal oxide nano-particle of claim 94, wherein said particle is structurally heterogeneous.
98. (New) The ultra-disperse semi-metal/metal oxide nano-particle of claim 97, wherein said nano-particle contains at least two different metal oxides.
99. (New) The ultra-disperse semi-metal/metal oxide nano-particle of claim 98, wherein the metal oxides are selected from a group consisting of  $\text{SiO}_2$ ,  $\text{Al}_2\text{O}_3$  and  $\text{TiO}_2$ .
100. (New) The ultra-disperse semi-metal/metal oxide nano-particle of claim 99, comprising partially alkylated  $\text{SiO}_2$ , adsorbing other metal oxide molecules, selected from the group consisting of  $\text{Al}_2\text{O}_3$  and  $\text{TiO}_2$ .
101. (New) The ultra-disperse semi-metal/metal oxide nano-particle of claim 99, comprising partially alkylated  $\text{SiO}_2$ , covalently bound to other metal oxide molecules, selected from the group consisting of  $\text{Al}_2\text{O}_3$  and  $\text{TiO}_2$ .
102. (New) The ultra-disperse semi-metal/metal oxide nano-particle of claim 94, wherein said particle has a substantially spherical shape.
103. (New) A biologically active composition, containing the ultra-disperse semi-metal/metal oxide nano-particle of claim 94, wherein said nano-particle serves as at least one of the following, selected from the group consisting of a carrier, an adsorbent for a biological active material and a nano-particle capable of interaction with at least one one of the following, selected from the group consisting of a particular biological cell, an organelle, a material derived therefrom, a particular microorganism, a material derived therefrom and the surrounding medium, wherein such interaction results in at least one of the following, selected from the group consisting of desired biological activity enhancement, inactivation promotion of said

harmful, microorganism and inactivation promotion of a material derived therefrom.

104. (New) The biologically active composition of claim 103, wherein said nano-particle interacts with at least one of the following, selected from the group consisting of a biological cell, an organelle, a material derived therefrom, molecules in the surrounding medium and ions in the surrounding medium, to form three-sided structured network.
105. (New) The biologically active composition of claim 103, wherein said nano-particle interacts with at least one of the following, selected from the group consisting of a particular microorganism and a material derived therefrom, resulting in inactivation of said microorganism and of said material derived therefrom.
106. (New) A process for preparing the ultra-disperse metal oxide nano-particle of claim 94, wherein the particle comprises partially methylated  $\text{SiO}_2$ , comprising:
- (a) performing a heat treatment of hydrated  $\text{SiO}_2$  at 200-650 degrees C to remove the physically adsorbed and bound structured water;
  - (b) exposing the de-hydrated  $\text{SiO}_2$  formed in step (a) to a methylating agent, preferably selected from the group consisting of dimethyltrichlorosilane, trimethyltrichlorosilane, cyclosiloxane and polysiloxane, in at least one of, a gas and a liquid environment, at 250-300 degrees C, for a period of time required to obtain a partial, pre-determined ratio of methylation;
  - (c) removing the excess of reagents from the reaction product, followed by hydrolysis of the remaining, non-reacted chlorine, while heating the product at 250-300 degrees C, for one hour, in the presence of saturated water vapor; and
  - (d) separating the partial methylated  $\text{SiO}_2$  nano-particle obtained.